

(12) UK Patent Application (19) GB (11) 2 285 886 (13) A

(43) Date of Publication 28.07.1995

(21) Application No 9419924.7

(22) Date of Filing 04.10.1994

(30) Priority Data

(31) 940048

(32) 21.01.1994

(33) IE

(71) Applicant(s)

Square D Company

(Incorporated in USA - Delaware)

Executive Plaza, Palatine, Illinois 60067,
United States of America

(72) Inventor(s)

Desmond Regan

Dermot Hurst

Thomas O'Carroll

(74) Agent and/or Address for Service

Urquhart-Dykes & Lord

Alexandra House, 1 Alexandra Road, SWANSEA,
SA1 5ED, United Kingdom

(51) INT CL⁵

H01H 71/74 71/02

(52) UK CL (Edition N)

H1N NCZA N214 N241 N61X N671 N818

(56) Documents Cited

GB 1355035 A

GB 1354301 A

GB 0966196 A

(58) Field of Search

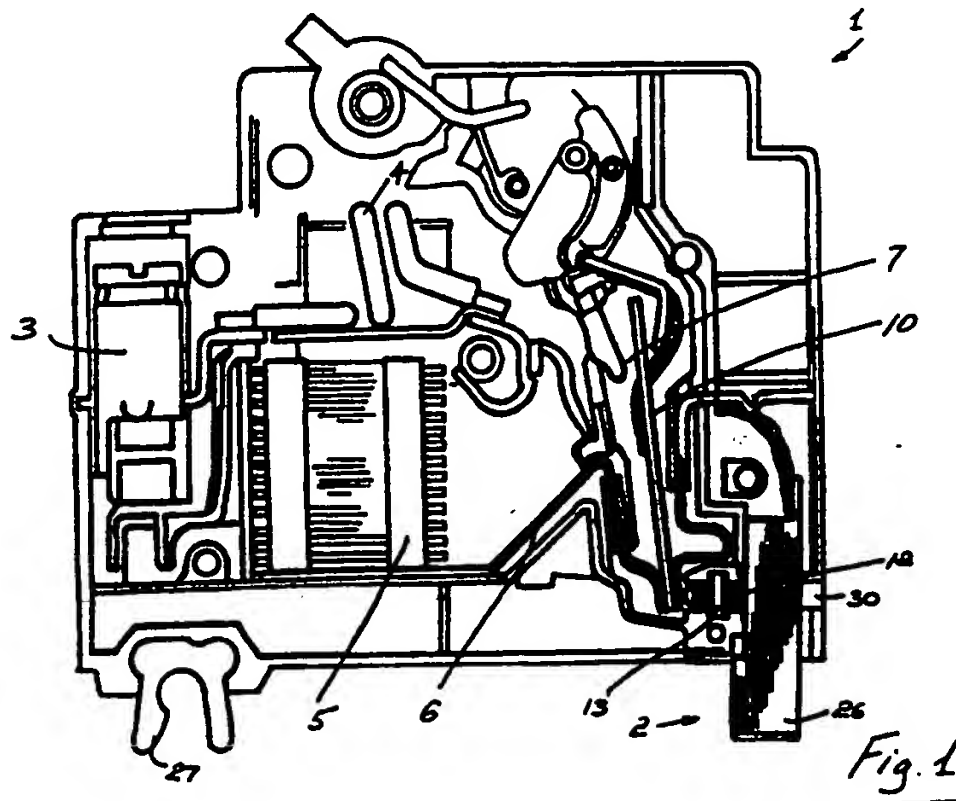
UK CL (Edition M) H1N NCA NCF NCG NCM NCN

NCT NCX NCZA

INT CL⁵ H01H

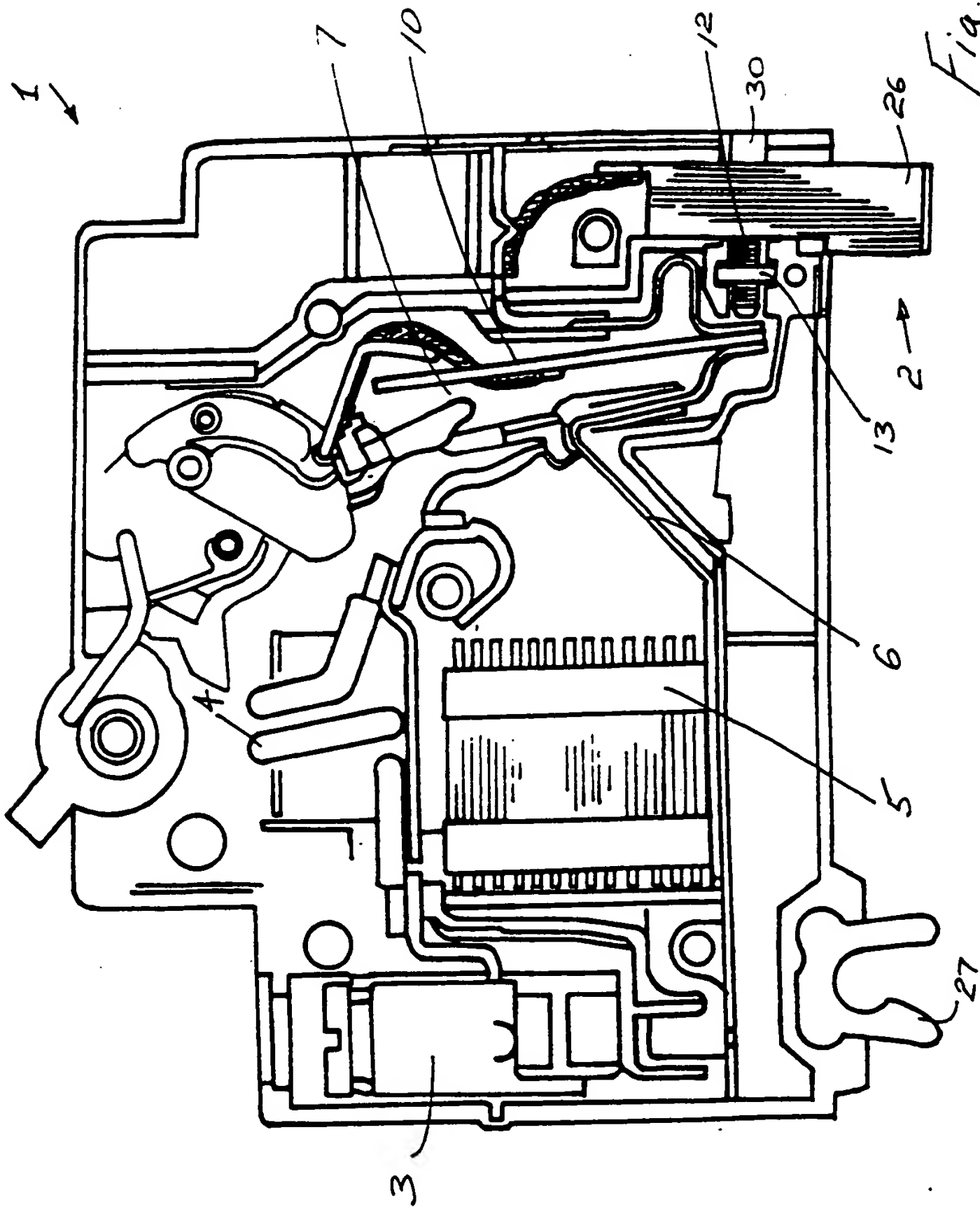
(54) Circuit breaker

(57) A circuit breaker comprises a housing defined by a base and cover, upper and lower rail mounting devices 26, 27 extending from the rear of the housing and an aperture 30 extending through a wall of the housing adjacent to one of the rail mounting devices for providing access to a calibration device 12 within the housing, eg for adjusting a bimetal 10. The aperture 30 may be positioned between a pair of spaced apart jaws defining the upper rail mounting device 26 which ensures that the calibration device 12 can only be operated when the circuit breaker is disconnected from the electrical supply.



GB 2 285 886 A

1/4



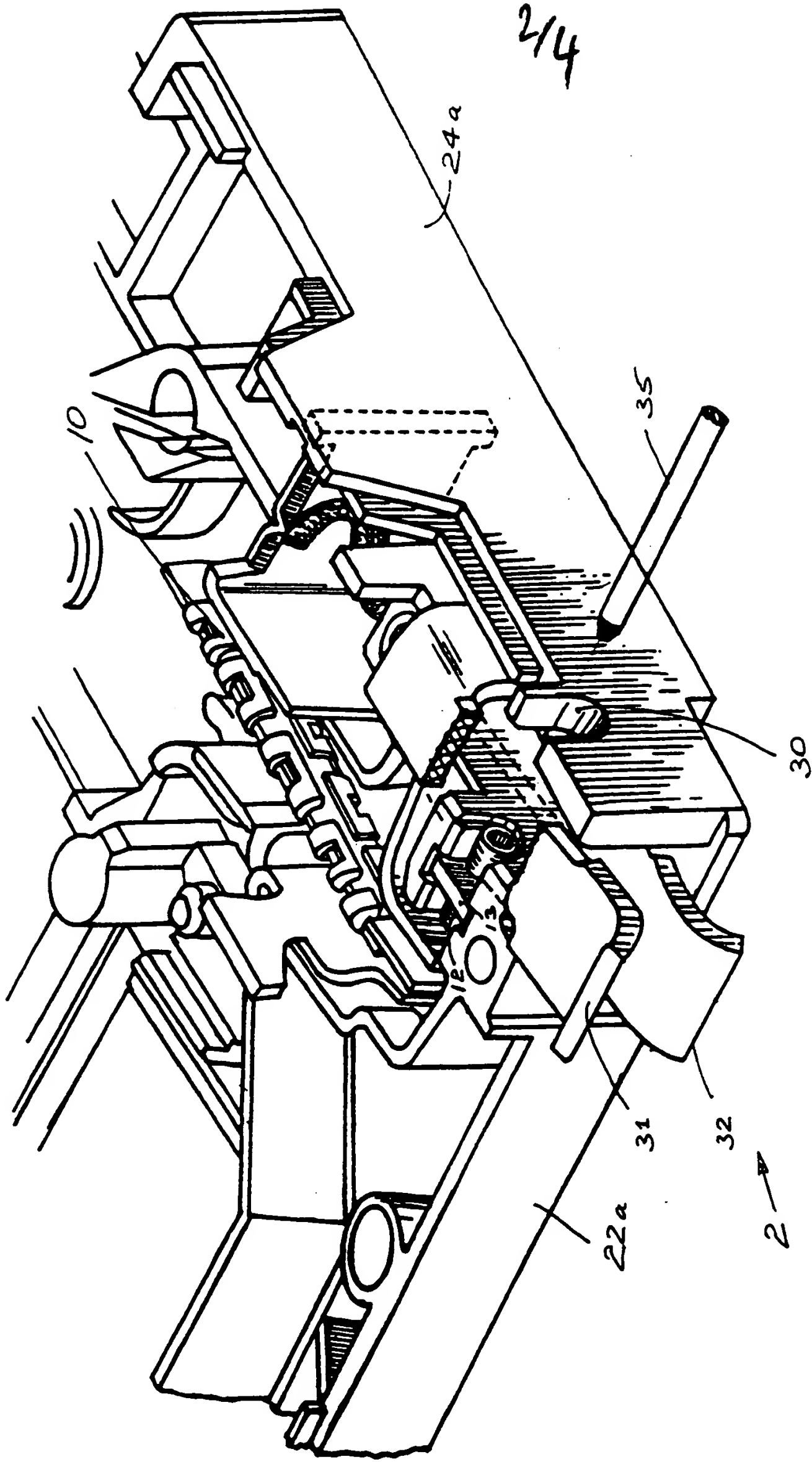


Fig. 2

3/4

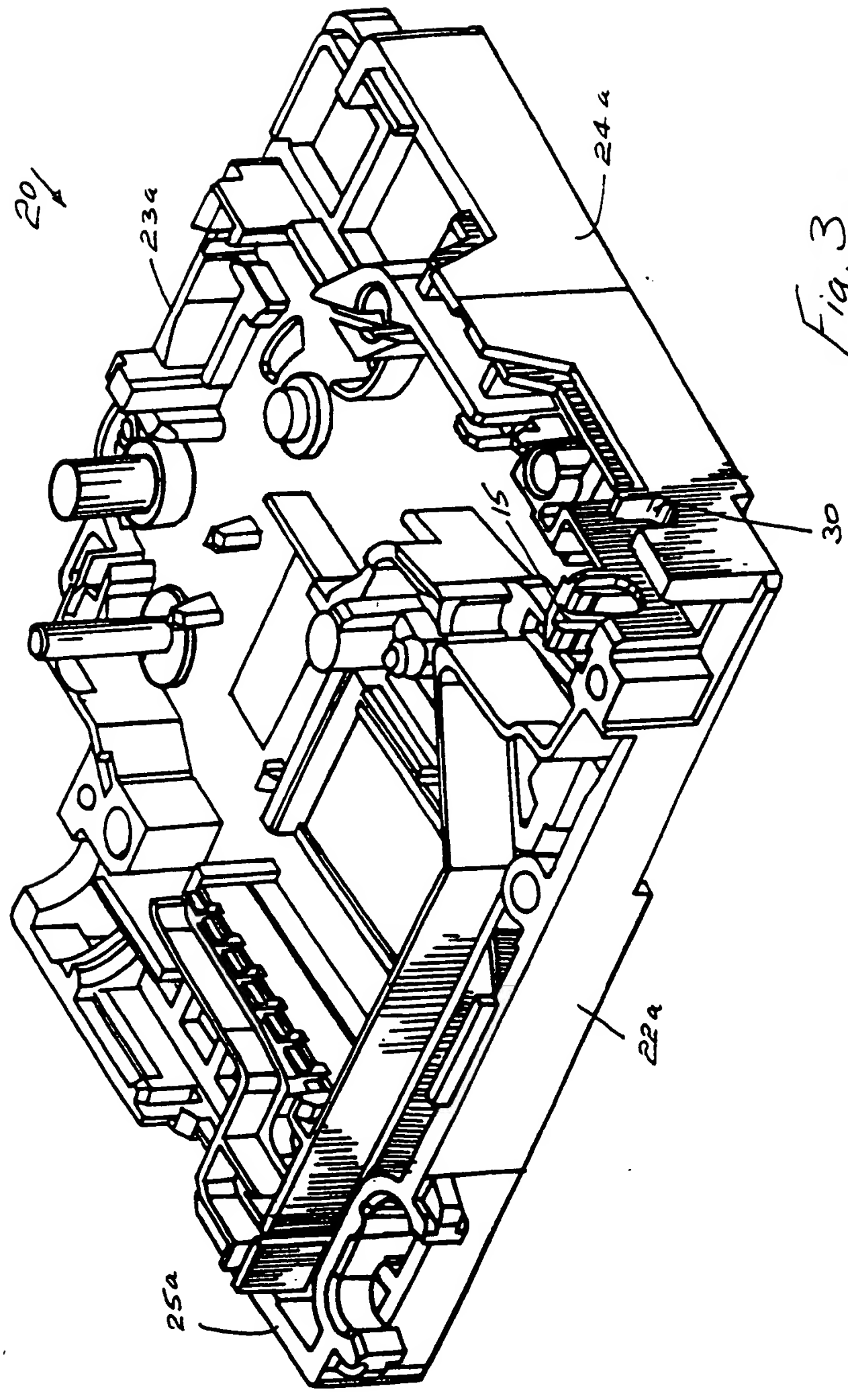


Fig. 3

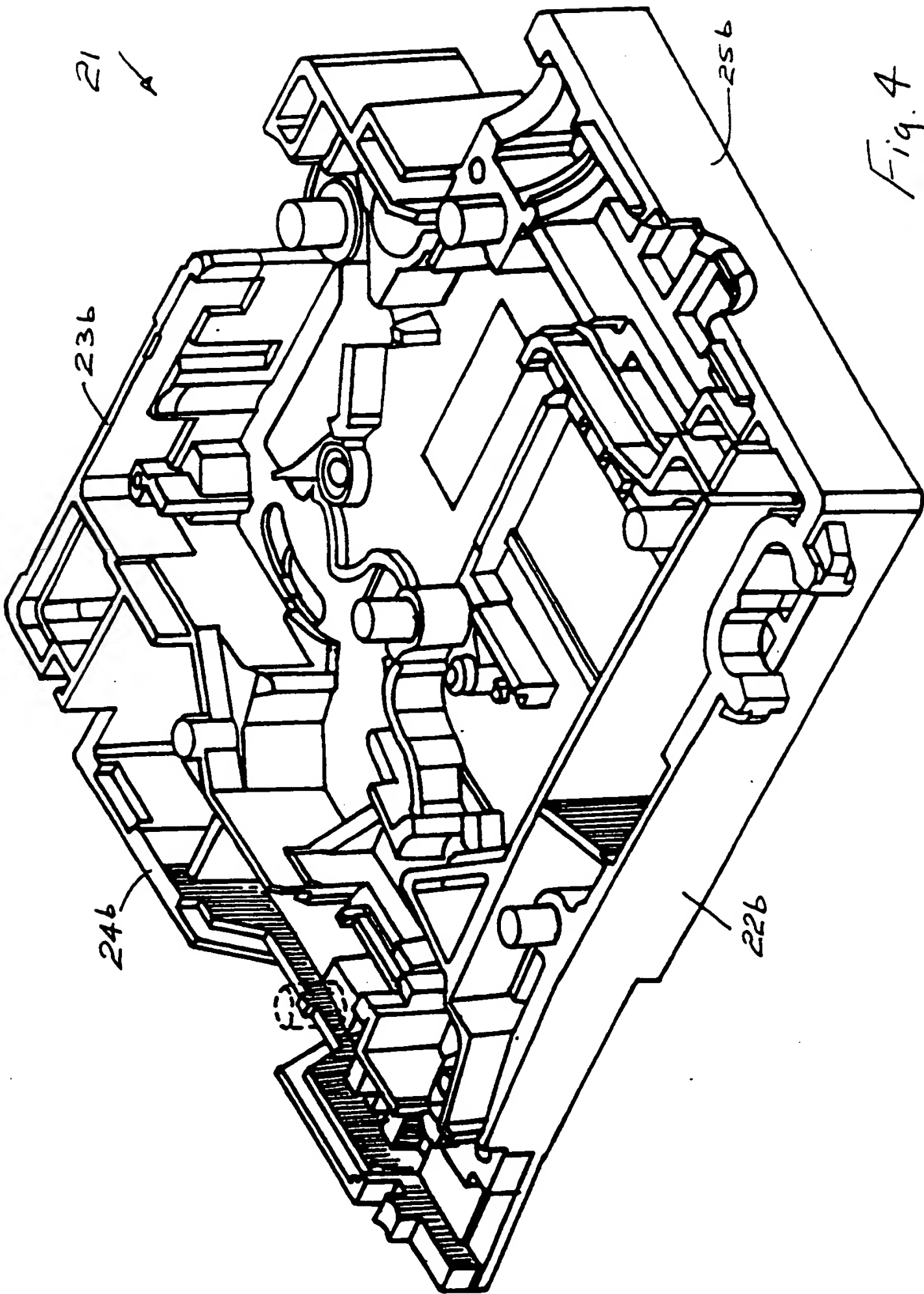


Fig. 4

"A Circuit Breaker"

The invention relates to a circuit breaker.

5 More particularly, the invention relates to a circuit breaker of the type comprising a base and a cover, the base and/or cover having a rear wall portion, a front wall portion and a pair of side wall portions extending between the front and rear wall portions to define an enclosure, upper and lower rail mounting devices extending from the rear wall of the housing, an aperture extending through a wall of the housing through which access is gained to a
10 calibration device in the enclosure.

Circuit breakers of this type are known. In conventional circuit breakers however the aperture through which access is gained to the calibration device in the enclosure is generally located in a position such that the calibration
15 can be relatively easily tampered with even in some cases while the breaker is in use. In some cases the calibration aperture is covered by a separate cover, however, this is not entirely satisfactory as the cover may also be removed.

20 There is therefore a need for an improved circuit breaker which will overcome this difficulty.

This invention is characterised in that the aperture through which access is gained to a calibration device in the housing extends through a wall of the housing adjacent
25 to the upper or lower rail mounting devices.

Th advantag of this arrangem nt is in locating the
access to the calibration d vic in an inacc ssible
position so that the calibration cannot be easily tamper d
with and more particularly cannot be tampered with while
5 the circuit breaker is in use. This removes the need to
have a cover over the calibration device.

In one embodiment of the invention the aperture extends
through a wall of the housing adjacent to the upper rail
mounting device. The advantage of this arrangement is
10 that the upper rail mounting device is usually a line
terminal for coupling to a source of electricity and the
calibration cannot be tampered with without uncoupling the
circuit breaker from the source of electricity.

In one arrangement, the upper rail mounting device
15 comprises a pair of spaced-apart jaws extending from the
rear wall of the housing and the aperture extends through
the housing between the jaws.

In a preferred embodiment of the invention, the aperture
extends through a side wall of the housing.

20 In one embodiment of the invention the circuit breaker
includes a bimetallic element mounted in the enclosure and
the calibration device comprises a calibration screw
engaging the bimetallic tripping element.

In a preferred embodiment of the invention the calibration
25 screw is rotatably mounted in a nut which is an
interference fit in a slot in the base of the circuit
breaker housing.

The invention will be more clearly understood from the
following description thereof giv n by way of xample only
30 with refer nce to the accompanying drawings in which :-

Fig. 1 is a view of a circuit breaker according to the invention with a cover removed;

Fig. 2 is a perspective view of a detail of the circuit breaker of Fig. 1;

5 Fig. 3 is a perspective view of a base part of the circuit breaker; and

Fig. 4 is a perspective view of a cover part of the circuit breaker.

10 Referring to the drawings, there is illustrated a circuit breaker 1 including a line terminal 2 for coupling to a source of electricity and a load terminal 3 for coupling to a load. The current path includes a coil 4 and an arc runner 6. An arc stack 5 assists in breaking any arc formed when contacts 7 are separated under load. The
15 contacts 7 may be separated in response to operation of a bimetal 10. The bimetal 10 is adjusted by means of a calibration screw 12. The coil 4 causes separation of the contacts 7 in the event of a current surge.

20 The circuit breaker 1 comprises a base 20 and a cover 21. The base 20 and cover 21 both have rear wall portions 22a, 22 respectively, front wall portions 23a, 23b, upper sidewall portions 24a, 24b and lower sidewall portions 25a, 25b respectively which cooperate on assembly of the
25 base 20 and cover 21 to form an enclosure for the various components of the circuit breaker 1.

Upper and lower rail mounting devices 26, 27 extend from the rear of the housing. The rail mounting device 26 is defined by the line terminal 2 which includes a pair of spaced-apart jaws 31, 32.

5 An aperture 30 is provided in the upper sidewall portion 24a adjacent to the upper mounting element defined by the line terminal 2 for access to the calibration screw 12 by a calibration device 35, portion of which is illustrated in Fig. 2.

10 It will be noted that the aperture 30 is positioned so that the calibration device 35 must pass through the jaws 31,32 of the line terminal 2 to engage the calibration screw 12. This is particularly advantageous as it ensures
15 that the calibration screw 12 can only be operated when the line terminal 2 is disconnected from the electrical supply, i.e. when the breaker is not in use. A standard calibration screw 12 may be used. Typically the screw is contained within a nut 13 which is captive in a slot 15 in
15 the base 20 of the enclosure. The locking of the screw 12 is achieved by an interference fit between the screw and the enclosure surface in the area of the nut 13.

20 The primary advantage of the invention is in providing necessary access to the calibration screw for calibrating the bimetal while ensuring that the circuit breaker must
20 be disconnected from the supply for calibration.

25 Many variations on the specific embodiment of the invention will be readily apparent and accordingly, the invention is not limited to the embodiment hereinbefore
25 described which may be varied in both construction and detail.

CLAIMS

1. A circuit breaker comprising a housing defined by
a base and a cover, the base and/or cover having
a rear wall portion, a front wall portion and a
5 pair of side wall portions extending between th
front and rear wall portions to define an
enclosure, upper and lower rail mounting devices
extending from the rear of the housing, an
aperture extending through a wall of the enclosure
10 through which access is gained to a calibration
device in the enclosure;

characterised in that the aperture extends through
a wall portion of the housing adjacent to the
upper or lower rail mounting devices.
- 15 2. A circuit breaker as claimed in claim 1 wherein
the aperture extends through a wall portion of the
housing adjacent to the upper rail mounting
device.
- 20 3. A circuit breaker as claimed in claim 2 wherein
the upper rail mounting device comprises a pair of
spaced-apart jaws extending from the rear wall of
the housing and the aperture extends through the
housing between the jaws.
- 25 4. A circuit breaker as claimed in claim 3 wherein
the aperture extends through a side wall of the
housing.
5. A circuit breaker as claimed in any preceding
claim wherein the circuit breaker includes a
bim tallic element mounted n the enclosure and the

calibration device comprises a calibration screw engaging the bimetallic element.

- 5 6. A circuit breaker as claimed in any preceding claim wherein the calibration screw is rotatably mounted in a nut which is an interference fit in a slot in the base of the circuit breaker housing.
7. A circuit breaker substantially as hereinbefore described with reference to the accompanying drawings.

Search Examiner
Mr P Corbett

(ii) Int Cl (Ed.5) H01H

Date of completion of Search
2 December 1994

Documents considered relevant following a search in respect of Claims :-
1 to 7

(i) UK Patent Office collections of GB, EP, WO and US patent specifications.

(ii)

X:	Document indicating lack of novelty or of inventive step.	P:	Document published on or after the declared priority date but before the filing date of the present application.
Y:	Document indicating lack of inventive step if combined with one or more other documents of the same category.	E:	Patent document published on or after, but with priority date earlier than, the filing date of the present application.
A:	Document indicating technological background and/or state of the art.	&:	Member of the same patent family; corresponding document.

Category	Identity of document and relevant passages	Relevant to claim(s)
X	GB 1355035 (WILCOX) see Figure 1	1,2
X	GB 1354301 (THE RUCKER CO) see Figure 2	1,2
X	GB 0966196 (SQUARE D) see Figure 2	1,2,5

Databases: The UK Patent Office database comprises classified collections of GB, EP, WO and US patent specifications as outlined periodically in the Official Journal (Patents). The on-line databases considered for search are also listed periodically in the Official Journal (Patents).